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PATENT COOPERATION TREATY

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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

PATENT DEPT.

NOV 24 2004

Applicant's or agent's file reference L3800-02	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/31364	International filing date (day/month/year) 02 October 2003 (02.10.2003)	Priority date (day/month/year) 09 October 2002 (09.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): C04B 24/12 and US Cl.: 106/727, 808, 823		
Applicant W.R. GRACE & CO.-CONN.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 27 April 2004 (27.04.2004)	Date of completion of this report 26 October 2004 (26.10.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Anthony J. Green Telephone No. 571-272-1700 Jean Proctor Paralegal S-2

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US03/31364

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description:
 pages 1-11 as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.
- ☒ the claims:
 pages NONE, as originally filed
 pages NONE, as amended (together with any statement) under Article 19
 pages NONE, filed with the demand
 pages 12, filed with the letter of 30 September 2004 (30.09.2004)
- ☒ the drawings:
 pages 1-2, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
 pages NONE, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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PCT/US03/31364

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>1-8</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-8</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-8</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-8 meet the criteria set out in PCT Article 33(2)&(3) because the prior art does not teach or fairly suggest the instant method for enhancing grinding efficiency and resulting composition.

Claims 1-8 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claims 1-8 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims are indefinite for the following reasons:

In claim 1 the phrase "said amines" appears to lack proper antecedent basis as claim 1 does not specifically refer to "amines". Note that claim 1 concerns various diamines and alkanolamines.

Claims 2 and 4-5 are confusing as written as it is unclear as to which composition applicant is referring to in these claims (i.e. a cement clinker plus the additives or a cement composition comprising the additives). It is unclear as to how the composition further limits the method of enhancing grinding efficiency when claim 1 does not refer to the process of making a composition.

In claim 8 the phrase "the mill" lacks proper antecedent basis.

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1. A method for enhancing grinding efficiency in a cement grinding process, comprising: introducing, into the grinding of cement clinker to produce cement, tetrahydroxylethylethylene diamine or derivative thereof and an alkanolamine selected from the group consisting of triethanolamine, triisopropanolamine, and diethanolisopropanolamine, the ratio of said tetrahydroxylethylethylene diamine to said alkanolamine being 95:5 to 5:95 based on weight, and the dosage of said amines to cement being 0.001% s/s to 0.5% s/s.

2. A composition provided by the method of claim 1.

3. The method of claim 1 wherein the dosage of said amines to cement is 0.01% s/s to 0.1% s/s.

4. The composition of claim 2 wherein said tetrahydroxylethylethylene diamine is present in the amount of 20-30% and said diethanolisopropanolamine is present in the amount of 80-70%, said percentages based on total weight of said amines.

5. The composition of claim 4 comprising triethanolamine.

6. The method of claim 1 comprising incorporating tetrahydroxylethylethylene diamine in the amount of 28-38%, triethanolamine in the amount of 9-19%, and diethanolisopropanolamine in the amount of 53-63%, said percentages based on weight of total amines.

7. The method of claim 1 wherein the incorporation of said tetrahydroxylethylethylene diamine and triethanolamine enhance Blaine fineness of cement produced from the grinding of said cement clinker above additive dosage of said amines when incorporated separately.

8. The method of claim 1 wherein said grinding of said cement clinker occurs in closed-circuit grinding wherein coarse ground material is returned into the mill for further grinding, the incorporation of said tetrahydroxylethylethylene diamine and triethanolamine decrease the amount of coarse material returned to the mill for further grinding.